

CLAIMS

WHAT IS CLAIMED IS:

1. A system for reinforcement of an automotive vehicle frame,  
comprising:
  - 5 (a) a skeleton member having a plurality of reinforcing ribs  
incorporated therein adapted for placement in a cavity defined in an  
automotive vehicle frame; and
  - (b) an expandable material over at least a portion of said skeleton  
member.
- 10 2. The system as claimed in claim 1, wherein said skeleton member is  
adapted for reinforcing a vehicle roof.
3. The system as claimed in claim 1, wherein said skeleton member is  
15 adapted for reinforcing a vehicle pillar.
4. The system as claimed in claim 1, wherein said skeleton member is  
adapted for reinforcing a vehicle frame rail.
- 20 5. The system as claimed in claim 1, wherein said skeleton member is  
adapted for reinforcing a vehicle frame cross member.
6. The system as claimed in claim 1, wherein said skeleton member is  
adapted for reinforcing a vehicle window frame.
- 25 7. The system as claimed in claim 1, wherein said skeleton member is  
adapted for reinforcing a vehicle deck lid.

8. The system as claimed in claim 1, wherein said skeleton member is adapted for reinforcing a vehicle hatch.

9. A member for use in a system for reinforcement of an automotive vehicle frame in response to an external load, comprising:

5 (a) a first portion having a plurality of beam elements with a longitudinal axis generally non-parallel to the load; and

(b) a second portion contiguous with said first portion, the second portion having a surface adapted for carrying an expandable material, which upon expansion helps distribute load over said surface in response to said load.

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10. The member as claimed in claim 9, wherein said material is a polymeric material.

11. The member as claimed in claim 10, wherein said material is a  
15 polymeric foam.

12. The member as claimed in claim 9, wherein said expandable material is an epoxy-based polymer foam.

13. The member as claimed in claim 9, wherein said expandable material  
20 is a heat activated expandable polymer foam.

14. The member as claimed in claim 9, wherein said expandable material is an expandable plastic foam that is generally free of tack to the touch.

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15. The member as claimed in claim 9, wherein said expandable material is an expandable plastic foam that can be activated at a temperature encountered in an automotive vehicle paint operation.

16. A reinforced roof and pillar system for an automotive vehicle,  
comprising:

(a) an automotive vehicle frame for a roof and pillar of an automotive  
vehicle, said frame having a plurality of wall portions defining a cavity therein; and

5 (b) a skeleton member disposed within said cavity and having a structural  
foam material in sealing contact with said skeleton member and at least one of said  
plurality of wall portions.

17. The member as claimed in claim 16, wherein said expandable material  
10 is a polymer foam.

18. The member as claimed in claim 16, wherein said expandable material  
is an epoxy-based polymer foam.

15 19. The member as claimed in claim 16, wherein said expandable material  
is a heat activated expandable polymer foam.

20. The member as claimed in claim 16, wherein said expandable material  
is an expandable polymer foam that is generally free of tack to the touch.

20 21. The member as claimed in claim 16, wherein said expandable material  
is an expandable plastic foam that can be activated at a temperature encountered in an  
automotive vehicle paint operation.

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